GENERAL ORDER NO. 75-C
(Supersedes G.O. No. 75-B, as amended)

PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

REGULATIONS GOVERNING THE PROTECTION OF CROSSINGS AT GRADE OF ROADS, HIGHWAYS AND STREETS WITH RAILROADS IN THE STATE OF CALIFORNIA

Adopted February 14, 1973. Effective February 14, 1973.
(Resolution No. ET- 1180)

Modified February 2, 1983. (Resolution No. ET- 1313)

***Added January 20, 2000. Effective January 20, 2000. (Resolution SX-27)**

****Added and Modified April 6, 2000. Effective April 6, 2000. (Resolution SX-31)**

IT IS HEREBY ORDERED by the Public Utilities Commission of the State of California, that the following regulations governing the protection of street, road and highway crossings with railroads be observed in this State unless otherwise authorized or directed by the Commission. (Issued in accordance with Chapter 6, Section 1202, Public Utilities Code).

1. **PURPOSE OF RULES**
   The purpose of these rules is to formulate uniform standards for grade crossing protection to be used in the State of California, the application of which may afford greater safety at railroad grade crossings.
2. **SCOPE OF RULES**
   These rules are not intended as complete construction specifications. Construction shall be according to accepted good practice for the given local conditions in all particulars not specified in the rules. Unless otherwise provided in these rules, this order shall not be retroactive with respect to grade crossings lawfully existing on its effective date, except that the Commission reserves the right to require, by appropriate proceedings, alterations or improvements at any such crossings.
3. **COMMISSIONIS STANDARD SIGNS AND SIGNALS**
   The Commission's standard signs and signals are generally similar in size, type and design to the recommended standards which constitute the railroad-highway grade crossing protection approved and authorized for use of member railroads by the Association of American Railroads as shown in Bulletin No. 6, dated 1966, entitled "Railroad-Highway Grade Crossing Protection", including all additions thereto and revisions thereof made prior to the effective date of this order.
4. **IDENTIFICATION OF PUBLIC CROSSINGS**
   4.1 Unless otherwise specified, each railroad shall at each public grade crossing of its track paint or otherwise maintain on the crossing signpost or other structure an identification number which has been assigned by the Commission, Such number shall be placed so as to be readily legible from the highway. In all matters pertaining to any crossing brought

to the attention of the Commission, reference shall be given to the assigned crossing number. (See Figure 11.)

4.2 At crossings of named streets within incorporated cities where the railroad is not required to maintain a Standard No. 1-R crossing sign, or other special types of signs or crossing signals supported by posts, pedestals, foundations or crossing gates, the crossing identification number will not be required. (For method of assigning crossing numbers, see the Commission's Form "M".)

5. PRIVATE CROSSINGS

5.1 The signs depicted in Figure 1 shall be installed at private railroad grade crossings where no automatic crossing protective device is in place. Two such masts with signs shall be installed at each private railroad grade crossing, one facing each road approach unless there is inadequate space to locate the sign or signs.

5.2 The lower sign shown in Figure 1 attached hereto shall be attached to automatic crossing protective devices when installed at private railroad grade crossings.

5.3 The language contained in the lower portion of the lower sign shown in Figure 1, commencing with and including the words "No Trespassing", shall be permitted at the option of the railroad, but is not required by the Commission (Decision No. 75094 in Case No. 8207).

6. INSTALLATION OF STANDARD SIGNS AND SIGNALS REQUIRED

At all grade crossings hereinafter opened there shall be installed, before opening two or more of the following standard signs or signals (Subsections 6.1 through 6.8) as authorized by the Commission. (Subsections 6.9 through 6.13 are not Commission requirements but are included for reference only.)

6.1 *Standard No. I-C.* A fixed sign consisting of an octagonal sign on a metal post with the word "Stop" in reflectorized white letters on reflectorized red background. A separate sign mounted on the same post shall indicate a private crossing in black letters on reflectorized white background. The private crossing sign may include a "No Trespassing" sign at the option of the railroad. (See Figure 1)

6.2 *Standard No. I-D.* A fixed rectangular sign on a wood or metal post consisting of black letters on reflectorized white background to indicate a crossing for pedestrians only. (See Figure 2)

6.3 *Standard No. I-R.* A fixed sign consisting of a wood or metal post, to which two blades are attached at an intersecting angle of approximately 90° having the words "Railroad Crossing" in black letters on reflectorized white background. (See Figure 3)

6.4 *Standard No. 8.* A flashing light signal, which by alternately flashing red lights in both directions along the street or highway, provides a warning of an approaching train. Signals shall be installed on both approaches of the street or highway except on one-way streets and a sign reading "Railroad Crossing", similar in design to Standard No. 1-R, shall be mounted on the signal mast above the flashing light assembly. (See Figure 4)

6.5 *Standard No. 8-A Cantilever.* A fixed or rotatable cantilever mounted on a mast, with additional flashing light units similar to Standard No. 8 in signal action. The flashing light units shall be installed over the roadway on the cantilever arm. (See Figure 5)

6.6 *Standard No. 8-B Cantilever.* A fixed or rotatable cantilever, mounted on a mast, with flashing light units and is similar to Standard No. 8 in signal action. The flashing light

units shall be installed over the roadway on the cantilever arm and used where a Standard No. 8 would be difficult to install because of location. (See Figure 6)

6.7 *Standards Nos. 9, 9-A and 9-B.* A crossing gate arm used in combination with Standards Nos. 8, 8-A or 8-B above. The gate mechanism may be mounted on the signal mast or separately on a pedestal located adjacent thereto. In operation, when activated by an approaching train, the gate arm is lowered to form a horizontal barrier between approaching vehicles and the track. A steadily burning red light shall be installed on the tip, and two or more flashing red lights shall be installed on the extended gate arm to provide a warning of an approaching train. Gate arms shall be in a horizontal position prior to the arrival of any train, not extend beyond the centerline of other than a one-way roadway and shall be raised after passage of a train. (See Figures 7, 8 and 9)

6.71 *Standards Nos. 9-C, 9-AC, and 9-BC.*** A four quadrant gate system used in combination with Standards Nos. 9, 9-A or 9-B above. The gate mechanisms may be mounted on the signal mast or separately on a pedestal located adjacent thereto. The gates mounted on the right side of the road shall be known as entrance gates, and the gates mounted on the left side of the road shall be known as exit gates. The installation of an approved audible device on the exit gate is optional. In operation, when activated by an approaching train, the gate arms are lowered. A steadily burning red light shall be installed on the tip, and two or more flashing red lights shall be installed on the extended gate arm. Entrance gate arms shall be in a horizontal position prior to the arrival of the train, and entrance and exit gates shall be raised after passage of the train. Entrance gate mechanisms shall be designed to fail in the down position, and exit gate mechanisms shall be designed to fail in the up position. The entrance gates shall begin their descent before the exit gates, and the entrance gates shall be horizontal before the exit gates are horizontal. When the gates are fully lowered the gap between the ends of the gates must be less than two feet if no median between lanes is present. If there is a median or if channelization devices are installed, the gap between the gate end and the median or channelization devices must be within one foot. A vehicle presence detection system should be installed as part of the four quadrant gate system, subject to a Commission staff diagnostic field meeting recommendation and an engineering study performed by the railroad or local road agencies. The vehicle presence detection system shall be designed to allow a vehicle to exit the crossing area. A written agreement between the railroad and the public agencies responsible for the roadway shall be included as part of the application to the Commission.

6.8 *Standard No. 10.* An automatic crossing signal used for pedestrian crossings where required by the Commission. It is similar to a Standard No. 8 crossing signal in signal action. (See Figure 10)

6.9 *Special Crossing Signs.* Special crossing signs for unusual conditions may be installed only after 30 days' advance written notice of such proposed installation to the Commission and the written approval of the Commission has been received. The Commission reserves the night to require a formal application before special crossing signs may be authorized.

6.10 *Railroad Crossing Pavement Markings.* Refer to: Traffic Manual-State of California Department of Public Works, 1971 Edition, Chapter 6, pages 6-11, and Figures 6-9, pages 6-14 (as amended) for location and use.

6.11 *Advance Warning Signs.* Use in accordance with Section 21362 of the Vehicle Code. It is mandatory for local authorities to provide these warning signs in advance of grade crossings under their jurisdiction.

6.12 *Multiple Track Signs.* Refer to: Traffic Manual-State of California Department of Public Works, 1971 Edition, Chapter 4, pages 4-14 (as amended) for use.

6.13 *Exempt Crossing Signs.* Use in accordance with Section 22452 of the Vehicle Code at grade crossings which have been declared exempt by Order of the Commission, Refer to: Traffic Manual-State of California Department of Public Works, 1971 Edition, Chapter 4, pages 4-37 (as amended) for location.

6.14 Protection shall not be installed so that an obstruction will impair a motorist's view of the signs or signals.

7. AUTOMATIC PROTECTION-GENERAL REQUIREMENTS

7.1 *Automatic Signals to Conform to Commission Standards.* All automatic signals hereinafter installed at a crossing at grade of highway with a railroad shall, unless otherwise authorized by the Commission, conform substantially to the specifications herein illustrated and designated as Figures 4 through 10. This rule is not to be construed as prohibiting automatic signals of a different type installed in accordance with previous orders of this Commission (former Commission Standards 3 through 7) nor shall it be construed as prohibiting the replacement in kind or the relocation of such signals at a particular crossing.

7.2 *Length of Circuit.* Crossing signals at main or branch line crossings shall be actuated by trains approaching on main tracks through track circuits or by electronic controls for approximately 25 seconds with limits of from 20 to 30 seconds in advance of the normally fastest train operated over the crossing protected, except where special conditions prevail. Tracks other than main tracks of branch or main lines shall be provided with a circuit or control which will activate the signals when a train occupies the crossing. Prolonged signal operation caused by standing cars or by opened switches within the signal limits of the crossing control circuits must be avoided whenever possible by the use of appropriate control devices.

7.3 *Signals Not to Operate After Passage of Train.* Controls for automatic crossing signals shall be arranged so that signals will display a warning aspect until, but not after, the rear of the train clears the crossing,

7.4 *Signals to Operate for Reverse Movements.* Where two or more tracks cross the road, highway or street at grade, and reverse running against the current of rail traffic is frequent, control of signals shall be so arranged as to give adequate warning of such reverse movements.

7.5 *Failure of Controls.* Crossing signals shall be installed so that failure of controls or other apparatus will result in a warning aspect being displayed.

7.6 *Manual Control May Be Used When Necessary.* At locations where numerous switching movements or other conditions would cause automatic control signals to operate unnecessarily or to an unreasonable extent, such signals may be supplemented by manual control governed by a flagman to reduce abnormal signal warning. Signals so equipped shall be automatically controlled during other periods.

7.7 *Painting.* Posts and assemblies of flashing light signals shall be painted white or silver, except those parts functioning as a background for the light signal indications, which shall be painted with non-reflecting black. The crossing sign shall be similar to Standard No. 1-R with the words "Railroad Crossing" in black letters on reflectorized white background. Gate arms shall be striped on both sides with 16-inch alternate diagonal reflectorized red and white strips.

7.8 *Warning Aspect:*

Flashes: Red lights shall flash alternately. The number of flashes of each light per minute shall be 30 minimum, 55 maximum.

*Light Unit:** The Light unit shall produce highway crossing signal red light in accordance with the American Railway Engineering and Maintenance-of-Way Association (AREMA) Signal Manual, Part 3.2.35-Recommended Design Criteria for Electric Light Unit for Highway-Rail Grade Crossing Signals including Light Emitting Arrays and Incandescent Lamps.

Hoods and Backgrounds: Lamps shall be properly hooded. Hoods and backgrounds shall be black. Backgrounds shall be 20 inches in diameter for 8 $^{3}/_{8}$-inch roundels and 24 inches in diameter for 12-inch roundels.

Range: When lamps are operated at normal voltage, the range, on tangent, shall be at least 300 feet on a clear day, with a bright sun at or near the zenith.

Spread: The beam spread shall be not less than three degrees each side of the axial beam under normal conditions. This beam spread is interpreted to refer to the point at the angle mentioned where the intensity of the beam is 50 percent of the axial beam under normal conditions.

Lenses and Roundels: Lenses and roundels shall be eight inches minimum, 12 inches maximum.

Short Range Indication: Signal shall display a satisfactory short range indication.

Peepholes: Peepholes may be used.

Display: Except as otherwise provided, signals shall display a danger warning in both directions along the highway. Unless omitted by permission of the Commission, the warning aspect shall be accompanied by the sounding of a bell.

7.9 *Auxiliary Signs and Signals.* Auxiliary signs and signals not included in the above, such as "No Right Turn", "No Left Turn" and train-activated advance warning signs authorized in advance by the Commission, may be used in conjunction with any of the above signs and signals.

7.10 *Traffic Signals Near Grade Crossings.* At some street and highway intersections, railroad tracks pass in or near the intersection and are protected by traffic signals. At such intersections preemption of the traffic signals by the railroad signals to avoid conflicting aspects of the traffic signals and the railroad crossing signals should be provided. (Refer to "Manual on Uniform Traffic Control Devices for Streets and Highways", Department of Transportation, Federal Highway Administration, 1971 Edition, Section 4B-21 (as amended) for details of installation and operation).

NOTE: 1. On a curbed street, the supporting posts shall be placed not less than three feet from the curb line; on an uncurbed street, where there are no shoulders, the supporting posts shall be placed at least six feet from the edge of the pavement and where there is a shoulder the supporting posts shall be offset from the traveled way a sufficient distance to clear the full width of shoulder on the approach plus four feet.

2. Requirements in these rules and specifications with respect to range of automatic signals and warning displays facing traffic, refer and shall only be applicable to traffic approaching the crossing on a straight line approximately parallel or tangential to the center line of the highway at the point where it crosses the tracks and shall not be applicable either to traffic approaching from other angles or directions or to approaching traffic where there are intervening hills, curves, buildings or other obstructions.

3. Alternate types of cantilever arms are acceptable provided that signal heads are positioned as shown. The bell may be installed at any suitable position on the mast.

(Notes above refer to Figures 4 through 9.)

8. AUTOMATIC CROSSING SIGNAL INSTALLATION

Unless otherwise ordered by the Commission, grade crossing signals shall be located in a conspicuous position at both corners of the crossing intersection on the right-hand side of highway traffic flow and in advance of the railroad track. Additional signals may be installed in the center of the street and in advance of the track where a median exists or is provided by the public agency having jurisdiction over the roadway approaching the crossing. All automatic protective devices may be placed on the same side of the railroad tracks where vehicular traffic is one way only. Backlights or bells are not required on signals installed on medians unless specifically ordered by the Commission at a particular location.

9. REPLACEMENT OF CROSSING PROTECTION

Absence of crossing signs and automatic protective devices due to accidents shall not be considered a violation of this order until after a reasonable time for replacement has elapsed.

10. REMOVAL, REDUCTION, OR SUBSTITUTION OR ADDITION OF WARNING DEVICES**

No railroad shall hereafter remove, change the type, or add an automatic warning device, crossing gate, crossing flagman or other forms of crossing warning device or reduce the hours during which any such warning method is maintained, unless prior consent for such removal, addition, or reduction shall have been secured from this Commission; provided, however, that a flagman on duty to temporarily direct at a crossing during an emergency, may be removed without such consent. Application for consent of the Commission may be in letter form; however, the Commission may require filing of a formal application and a hearing. Upon completion of any approved changes in warning devices, notice of such change shall be given the Commission within thirty (30) days following the close of the month in which the change is effective. (Report shall be on the Commission's Form "G".)

11. APPLIES TO RAILROADS

This General Order applies to all railroads subject to the jurisdiction of the Commission.

12. EXEMPTIONS

12.1 If, in a particular case, exemption from any of the requirements herein is desired, the Commission will consider the application for such exemption when accompanied by a full statement of the conditions existing and the reasons why such exemption is asked. It is to be understood that any exemption so granted shall be limited to the particular case covered by the application.

12.2 Nothing herein shall be construed as limiting the trial installation of experimental grade crossing protective devices, provided the Commission has approved such plan in advance of the time the device is installed.

12.3 Nothing herein shall be construed as prohibiting replacement of automatic crossing signaling devices of the same form or standard as designated in this or previous orders.

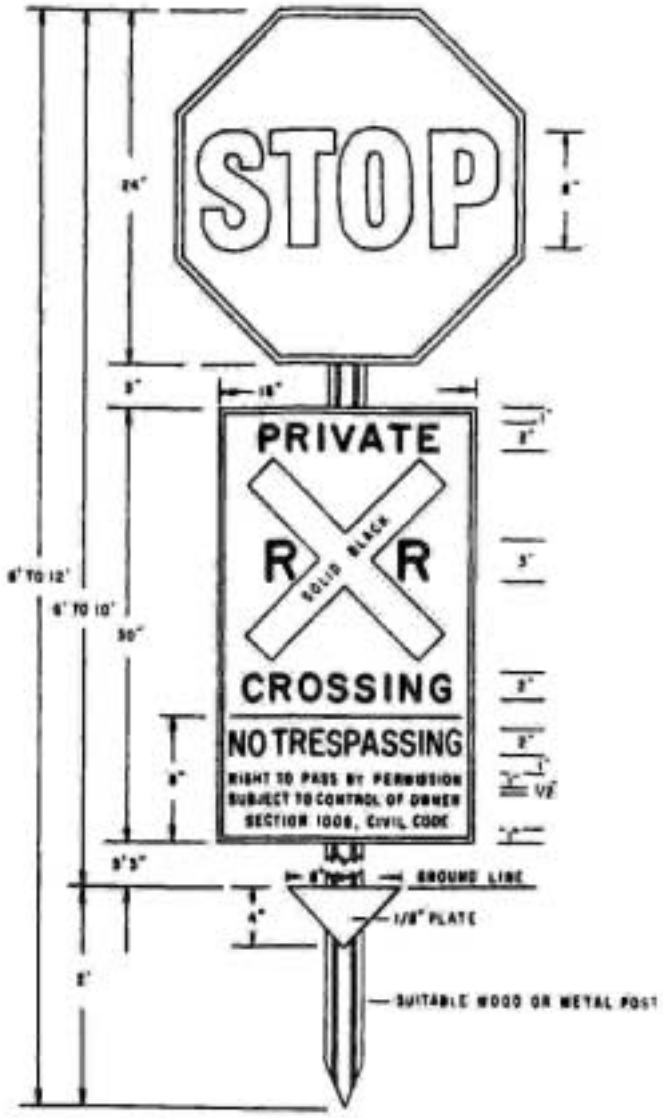
12.4 The Commission reserves the right to modify any of the provisions of these rules in specific cases, when, in the Commission's opinion, public interest would be served by so doing.

This order shall be effective on and after the 14th day of February 1973. Approved and dated at San Francisco, California, this 14th day of February 1973.

PUBLIC UTILITIES COMMISSION
OF THE- STATE OF CALIFORNIA

By WILLIAM R. JOHNSON
Secretary

Figure 1
STANDARD NO. 1-C



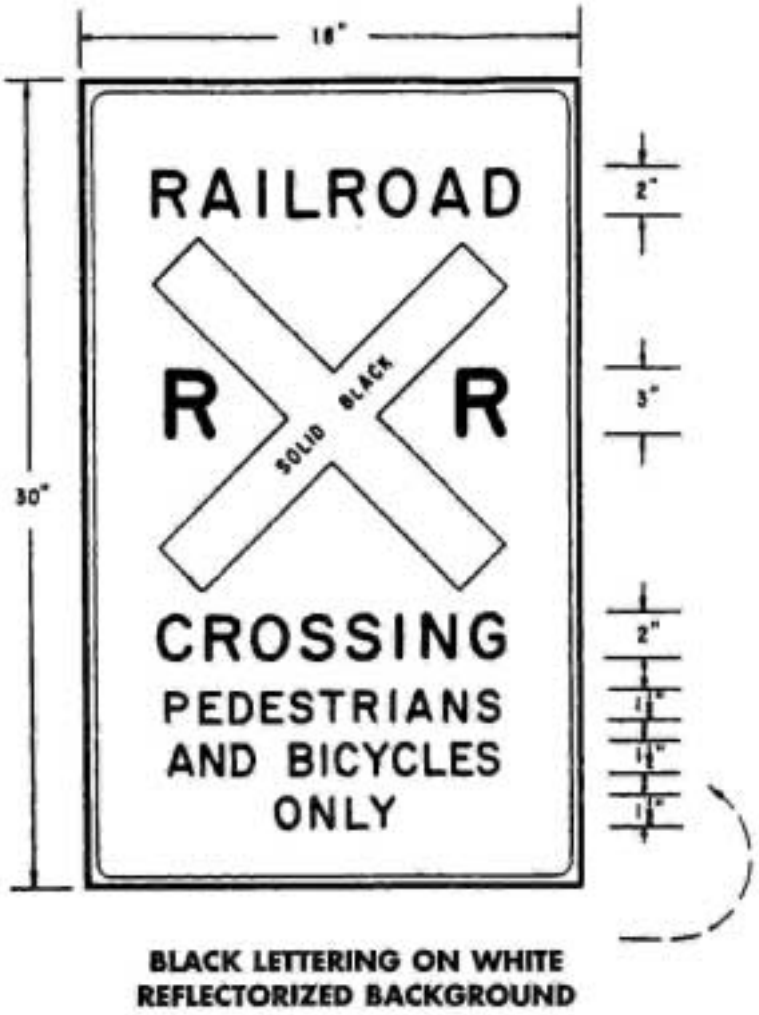
PRIVATE CROSSING SIGN

Characteristics:	Stop Sign:	Described as Standard No. R1-1 in the Manual on Uniform Traffic Control Devices for Streets and Highways U.S. Department of Transportation.
	Private Crossing Sign:	Black letters on reflectorized white background.

Figure 2

STANDARD NO. 1-D

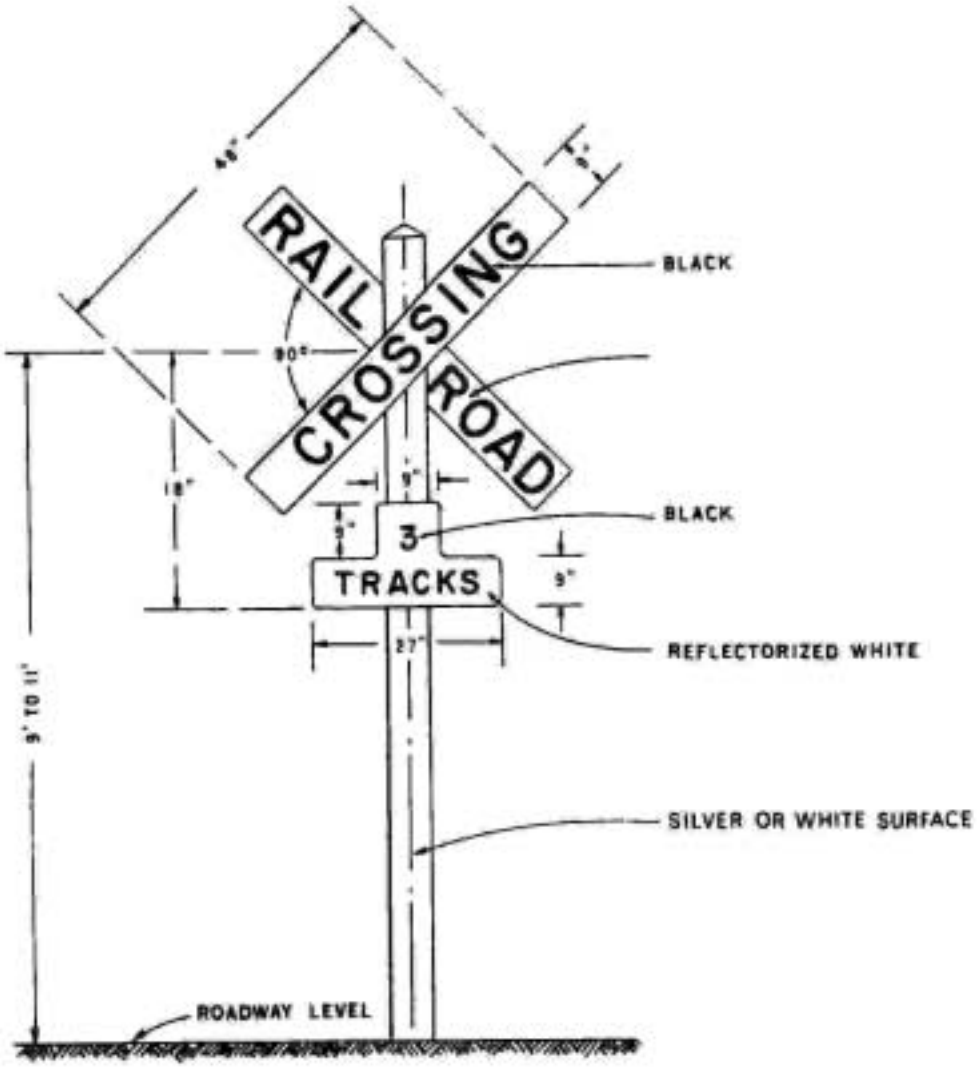
PEDESTRIAN AND BICYCLE RAILROAD GRADE CROSSING SIGN



BLACK LETTERING ON WHITE REFLECTORIZED BACKGROUND

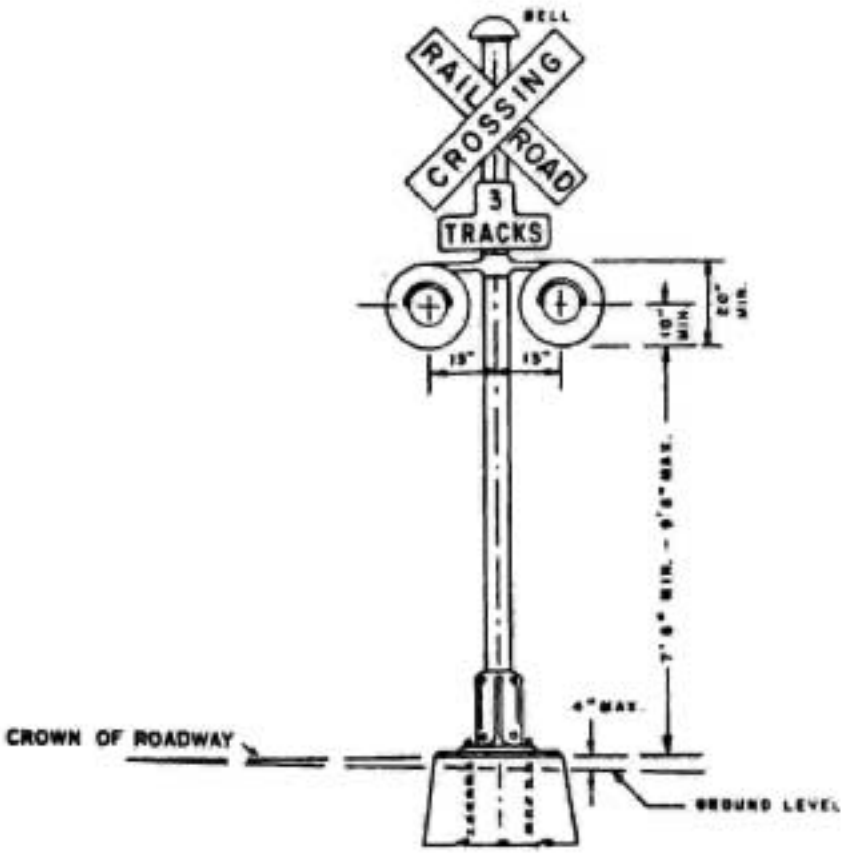
The wording "and bicycles" is optional and may be omitte where appropriate.

Figure 3
STANDARD NO. 1-R



The crossing shall be reflectorized white background with the words "RAILROAD CROSSING" in black letters. If there are two or more tracks, including sidings, the number of tracks shall be indicated on an auxiliary sign as shown above.

Figure 4
STANDARD NO. 8

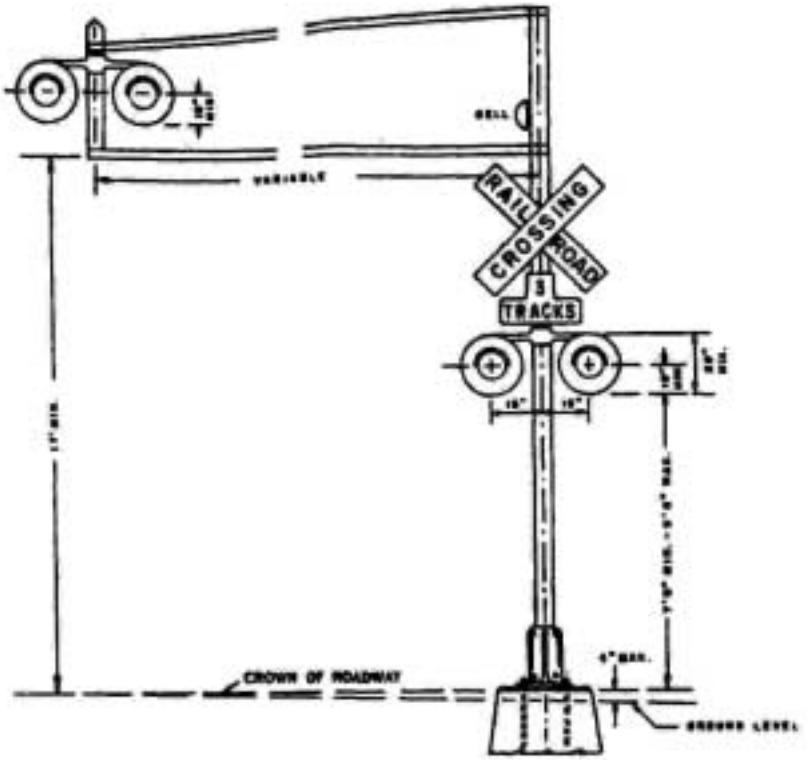


Top of foundation to be at the same elevation as the surface of the traveled way and no more than 4 inches above the surface of the ground.

HIGHWAY CROSSING SIGNAL ASSEMBLY
FLASHING LIGHT TYPE

SEE NOTES 1, 2 AND 3, SECTION 8.

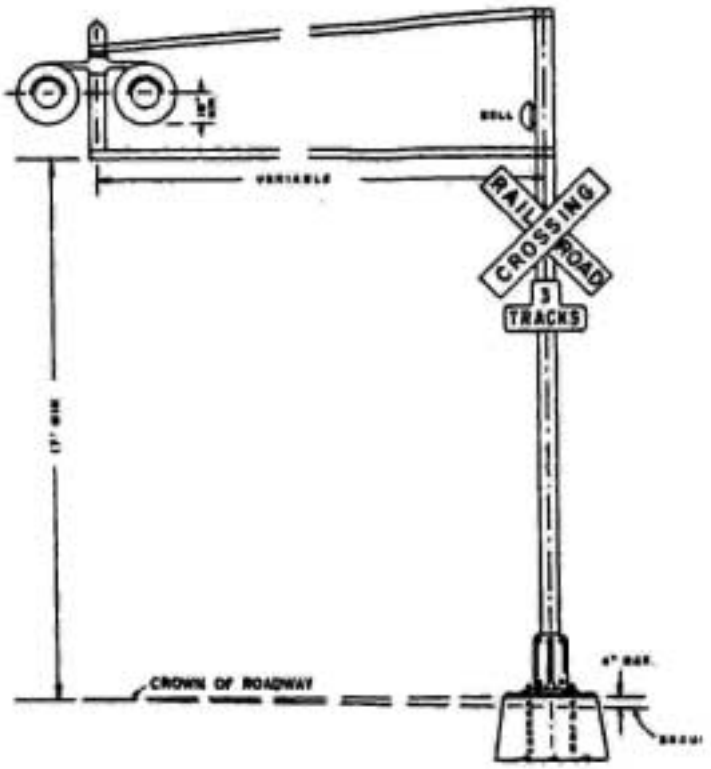
Figure 5
STANDARD NO. 8-A



HIGHWAY CROSSING SIGNAL ASSEMBLY—
CANTILEVER TYPE

SEE NOTES 1, 2 AND 3, SECTION 8.

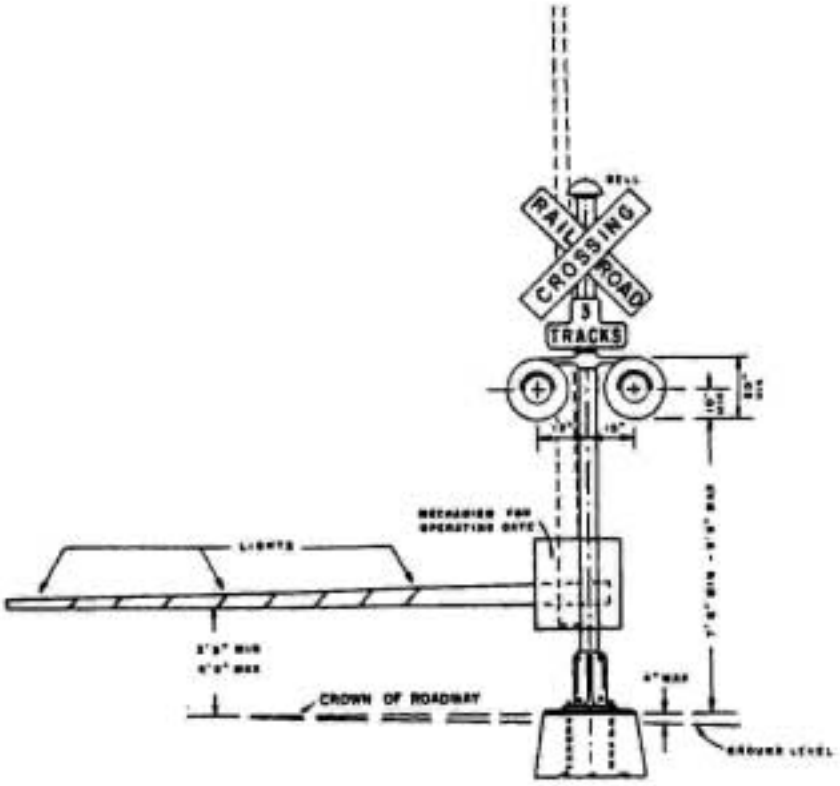
Figure 6
STANDARD NO. 8-B



HIGHWAY CROSSING SIGNAL ASSEMBLY—
CANTILEVER TYPE
(WITHOUT SIGNAL HEADS ON MAST)

SEE NOTES 1, 2 AND 3, SECTION 8.

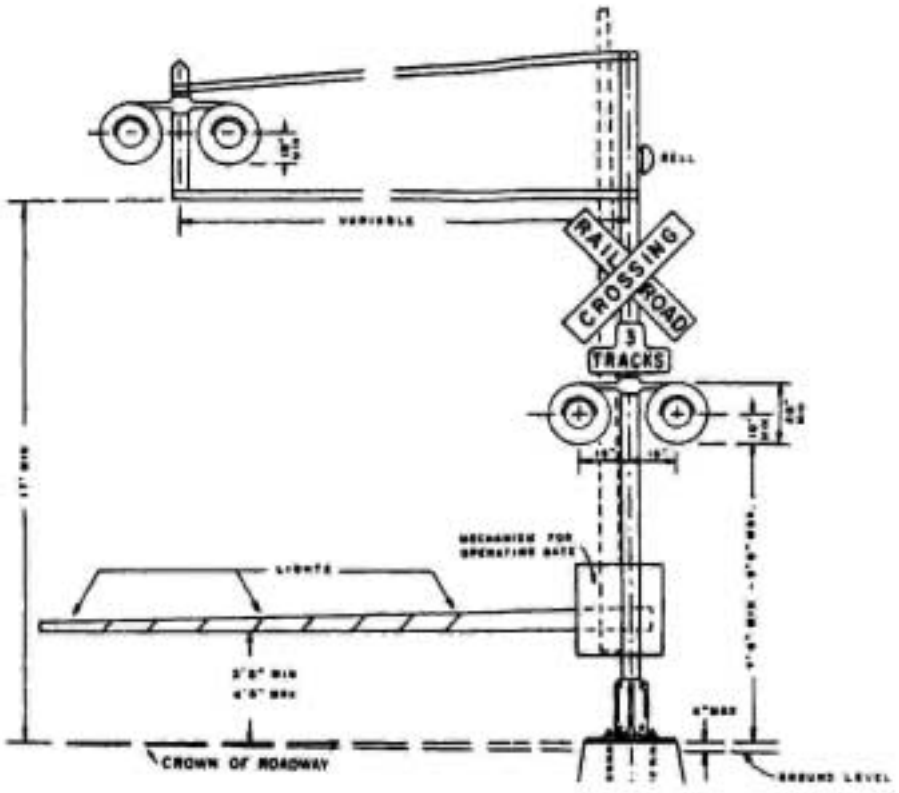
Figure 7
STANDARD NO. 9



HIGHWAY CROSSING SIGNAL ASSEMBLY
AUTOMATIC GATE TYPE

SEE NOTES 1, 2 AND 3, SECTION 8.

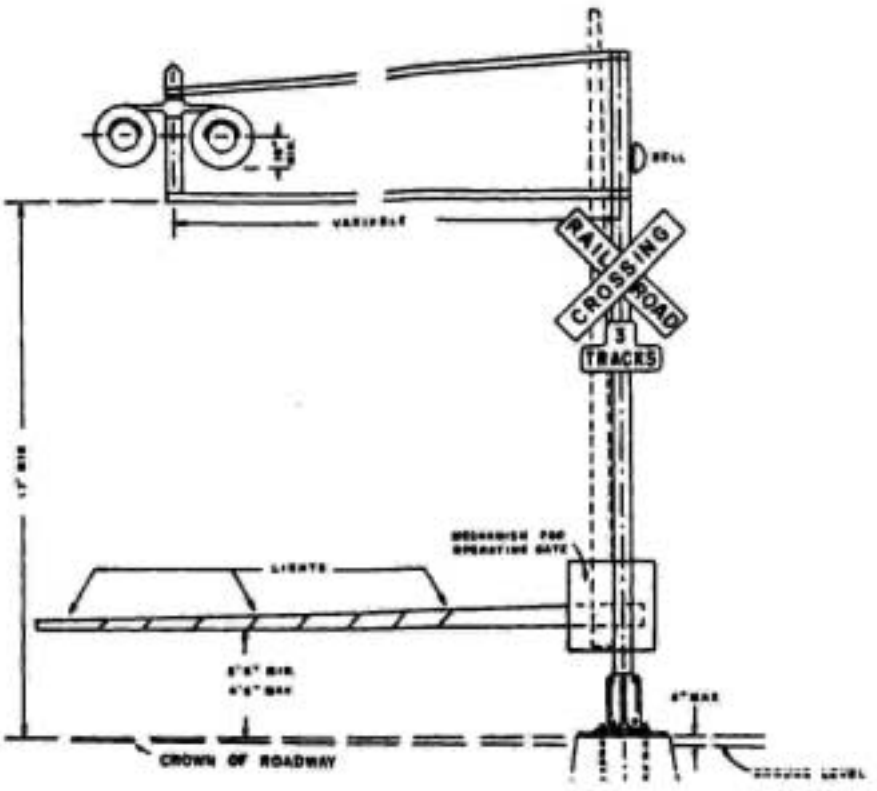
Figure 8
STANDARD NO. 9-A



HIGHWAY CROSSING SIGNAL ASSEMBLY
AUTOMATIC GATE TYPE WITH CANTILEVER ARM

SEE NOTES 1, 2 AND 3, SECTION 8.

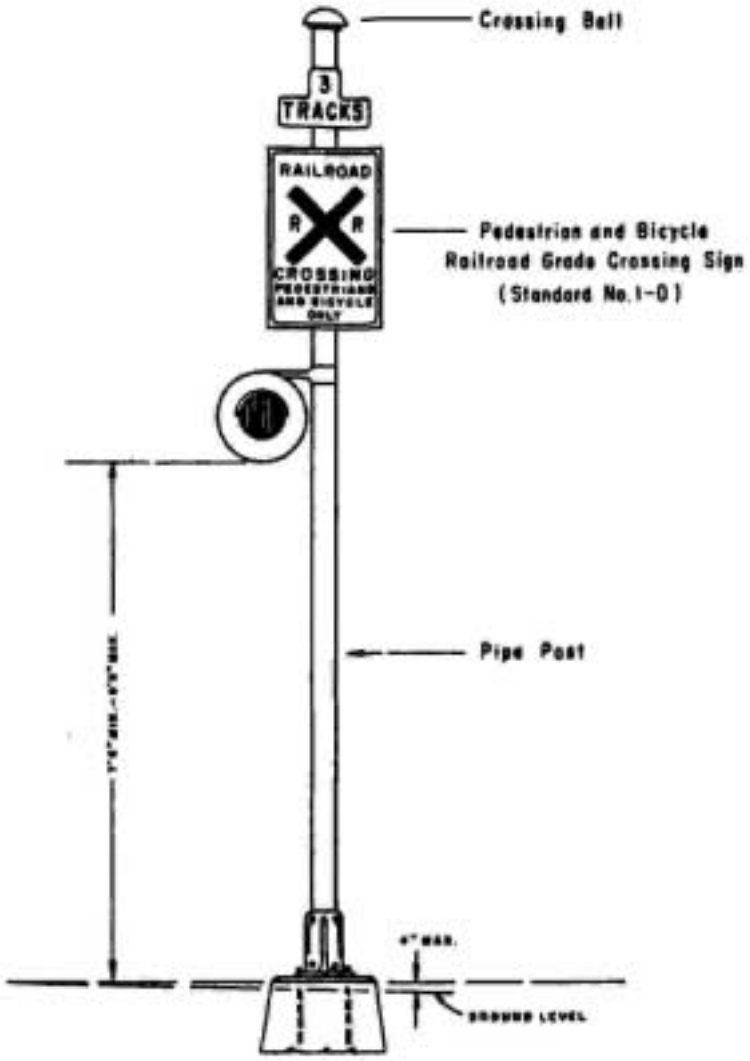
Figure 9
STANDARD NO. 9-B



HIGHWAY CROSSING SIGNAL ASSEMBLY
AUTOMATIC GATE TYPE WITH CANTILEVER ARM
(WITHOUT SIGNAL HEADS ON MAST)

SEE NOTES 1, 2 AND 3, SECTION 8.

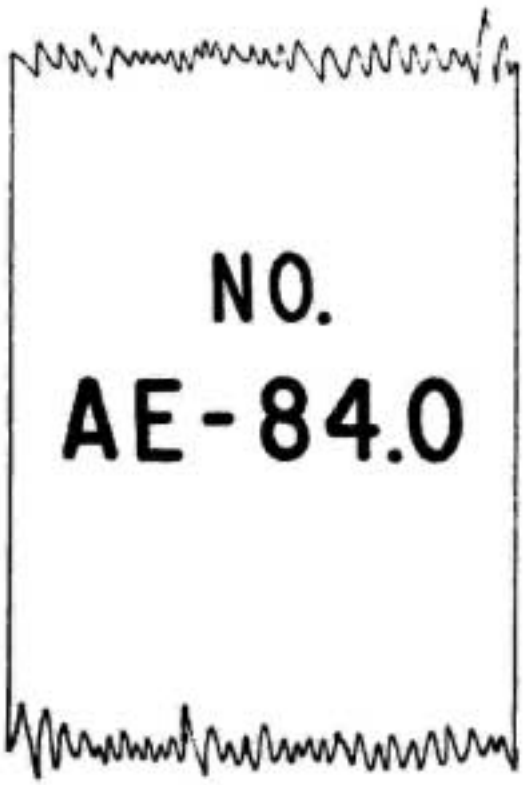
Figure 10
STANDARD NO. 10



PEDESTRIAN AND BICYCLE CROSSING PROTECTION
FLASHING LIGHT TYPE

SEE NOTES 1, 2 AND 3, SECTION 8.

Figure 11
SAMPLE OF MARKING
GRADE CROSSING NUMBERS



COLOR:—BLACK ON WHITE BACKGROUND.

CROSSING NUMBERS SHOULD BE PLACED ON EACH SIDE OF POST FACING HIGHWAY.

WHERE CROSSING SIGNS ARE NOT INSTALLED, BUT GATES, FLASHING LIGHTS OR OTHER SPECIAL SIGNALS ARE MAINTAINED, THE NUMBER SHOULD BE PLACED ON THE GATE MECHANISM HOUSING OR SIGNAL INSTRUMENT HOUSING.

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